

REMARKS

Applicant respectfully requests reconsideration and allowance of the subject application. Claims 23, 24, and 25 have been added. Claim 9 has been amended for clarity. Currently, claims 1-25 are pending.

35 U.S.C. §103 CLAIM REJECTIONS

The Examiner has rejected claims 1-22 under 35 U.S.C. §103 as being unpatentable over U.S. Patent No. 6,441,792 to Sievenpiper, et al. (hereinafter "Sievenpiper") in view of U.S. Patent No. 6,466,176 to Maoz, et al. (hereinafter "Maoz"). With respect to these rejections, the Applicants respectfully traverse.

It should be noted that Sievenpiper was filed on July 13, 2001. Applicants' date of invention was prior to the filing date of Sievenpiper, which would disqualify Sievenpiper as prior art under 35 U.S.C. §102(e); however, because Sievenpiper (in view of Maoz) does not render Applicants' invention unpatentable, the rejections shall be addressed upon their merits.

The claimed invention

The claimed invention is a multi-band antenna that operates in both the PCS band and the AMPS band. The antenna comprises two slot antenna elements, a transmission line to feed the slot antennas, and a reflector element. The antenna design allows the reflector element to be positioned one-sixth of a PCS band wavelength and one-thirteenth of an AMPS wavelength from the radiating elements. Configuring the antenna using a reflector and an electrically short cavity allows the antenna to be compact enough to be mounted to the top of a front windshield in a vehicle without

interfering with visibility, while at the same time preventing radiation from traveling into the passenger compartment of the vehicle.

Sievenpiper

Sievenpiper teaches placing an antenna module between a ground plane and a dielectric layer located above the passenger compartment in the roof section of a vehicle. Sievenpiper builds a dielectric material into the roof of the vehicle (either by using a dielectric material to construct the roof during the manufacture of the vehicle or by installing a dielectric sheet to the existing roof after manufacture). The antenna in Sievenpiper also incorporates a ground plane into the vehicle. The dielectric required in Sievenpiper separates the antenna elements from the ground plane.

Maoz

Maoz teaches a multi-band antenna that operates in a high frequency band and a lower frequency band comprising a dielectric, a ground plane, a feed line, and curved slots formed in the ground plane and coupled to the feed line. This configuration allows the slot to be resonant in a high frequency band and lower frequency bands.

The Examiner has not set forth a *prima facie* case of obviousness

As set forth in the MPEP:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skilled in the art, to modify the reference or to combined reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP 2143.

Independent Claim 1

Neither Sievenpiper nor Maoz, nor a combination of the two, teaches all of the elements found in claim 1. Claim 1 recites:

A multi-band antenna for use in conjunction with communication systems, comprising:
a radiating element, said element containing a first slot antenna operating in the PCS frequency band and a second slot antenna operating in the AMPS frequency band;
a reflector, said reflector coupled to said radiating element; and
at least one transmission line to feed said first and said second slot antennas.

Neither Sievenpiper nor Maoz teach using a reflector coupled to the radiating element. The Examiner states that Sievenpiper discloses a reflector (16). This, however, is not accurate. Element 16 in Sievenpiper is the antenna ground plane (see Fig. 6a). Ground plane 16 is electrically connected to the metal surface of the vehicle (the roof) to increase the effective size of the antenna ground plane. Ground plane 16 is not a reflector element as recited in claim 1.

The antenna of the present invention also is coupled to the vehicle roof to provide a large ground plane. This is accomplished via the conductive gasket 115 (see fig. 2). The use of the vehicle roof as a ground plane, however, is not related to using a reflector positioned in close proximity to the radiating elements to improve antenna gain and reduce the amount of radiation that passes into the passenger compartment.

Claim 1 recites a reflector, said reflector coupled to said radiating element. As this element is not taught or suggested in either Sievenpiper or Maoz, claim 1 is patentable over Sievenpiper and Maoz. Claim 1 is in condition for allowance.

Dependent claims

All remaining pending claims depend from claim 1, and, as such, are in condition for allowance. Additionally, the Examiner has raised improper rejections with respect to several dependent claims.

The Examiner has rejected claims 6-8, and in support thereof, states that “figure 3 of Sievenpiper discloses an antenna module whose sides and bottom surface constitute the reflector which appear to be substantially dimensioned with a depth as recited.” As discussed above, Sievenpiper does not teach a reflector and therefore cannot possibly teach the recited dimensions. Furthermore, Figure 3 in Sievenpiper does not contain any dimensional notations. As set forth in MPEP §2125, when the reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value. *See Hockerson-Halberstadt, Inc. v. Avia Group Int'l*, 222 F.3d 951, 956, 55 USPQ2d 1487, 1489 (Fed. Cir. 2000). In addition to not disclosing dimensions in Figure 3, Sievenpiper does not disclose dimensions of the antenna anywhere in the reference. As a result, this rejection is improper.

The Examiner has rejected claim 9 by making the conclusory statement that “since the disclosed antenna and reflector geometry are as recited, the energy entering the passenger compartment of the disclosed antenna system should be well within the recited parameters.” First, as recited above with respect to claims 6-8, the antenna and reflector geometry is not disclosed in Sievenpiper. In addition, Sievenpiper does not disclose any parameters with respect to the amount of energy entering the passenger compartment. The Examiner’s conclusory statement that the

system in Sievenpiper "should be well within the recited parameters" is unsupported by the reference. Thus, the rejection of claim 9 is improper.

Similarly, Sievenpiper does not disclose performance measurements for antenna gain. The Examiner has rejected claims 18-20, and in support thereof, states "the recited operational characteristics are obtainable with the use of the above disclosed and referenced antenna." This statement is unsupported by Sievenpiper. No gain measurements are disclosed in Sievenpiper. As there is no disclosure in Sievenpiper of any measurements of operational characteristics, this rejection is improper.

CONCLUSION

Claims 1-25 are in condition for allowance. Applicant respectfully requests reconsideration and issuance of the subject application. If any issues remain that preclude issuance of this application, the Examiner is urged to contact the undersigned attorney.

Respectfully Submitted,

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Date



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